# 5.OE.9 RAMP UP TEACHER NOTES (PG. 1 OF 2)

**SE** 5.4B, 5.1A, 5.1B, 5.1C, 5.1D, 5.1E, 5.1F, 5.1G

## Order of Operations

**Purpose** 5.OE.9 Ramp Up is a four corners activity. The teacher will project a problem. Students will choose which equation they think is correct and defend their choice.

**Note:** Problems #2 and #3 each have more than one right answer.

- [x] Equation/Number Sentence
- [x] Verbal Description
- [ ] Solution
- [x] Teacher-facilitated
- [ ] Tutoring/Intervention
- [ ] Small group
- [ ] Centers
- [ ] Challenge!

### Setting Up For Instruction

- Make one copy of **5.OE.9 Ramp Up Letter Cards**. Cut the letters apart and post around the classroom.
- Prepare **5.OE.9 Ramp Up Examples** so that it can be projected using your classroom technology.
- Gather **white boards** and markers for each student.
- (Optional) Make 1 copy of **5.OE.9 Ramp Up** for every 3-4 students.
- (Optional) Gather **sticky notes** (1 per student).

### Thought Extenders (1 of 2)

- What operation(s) do you think you'll need to solve? How do you know?
- Why did you choose this operation? What are the clues in the problem? What actions are taking place in the problem?
- Is the action in the problem putting things together or taking them apart? Is the problem creating groups? Is the problem counting groups? Is the problem separating things into groups?
- Why is the operation addition and not subtraction? Why is the operation multiplication and not division? Why is the operation multiplication and not addition? Why is the operation subtraction and not division?
- How is addition different from subtraction? How is it similar?
- How is multiplication different from addition? How is it similar?
- How is multiplication different from division? How is it similar?
- How is subtraction different from division? How is it similar?
- Is there more than one way to solve the problem?
- How can you combine all the operations to solve this problem into one number sentence?
- Is there more than one way to write the number sentence?
- Does the order matter in this number sentence?
- Do you need to use parentheses to group things? Are the parentheses necessary?

### How-To Guide

1. Project Problem #1. Ask students to read the problem and determine which choice contains the equation that matches the problem. They should write the letter on their white board and keep it hidden. Tell them that there may be more than one right answer. If a student thinks there is more than one right answer, have them pick the equation that they "like the best".
2. Count to three and have students move to the posted letter that matches their answer choice.
3. Once students have grouped themselves according to their answers, they should discuss in their small groups why they think their answer is correct and come up with the team explanation. Have a spokesperson from each group explain why their group is correct.
4. The groups should come to consensus about which equations are correct and which are incorrect. If there is more than one correct equation, have students discuss why each correctly fits the problem.
5. Once they have come to consensus, have the class move to the center of the room. Project each problem one at a time and repeat the four corners process.

Note: Problem #2 and #3 each have two right answers.

6. (Optional) After the equations have been chosen for each problem, place students in groups and have them write the equations and solve them using order of operations.

(Optional) Ask students to respond to this question on their **sticky notes**: How did you determine which equation was correct when you read the problem?

# 5.OE.9 RAMP UP TEACHER NOTES (PG. 2 OF 2)

## Thought Extenders (2 of 2)

- Do you need to use parentheses to group things? Are the parentheses necessary?
- Will the equation that you wrote answer the question in the problem?
- What are the clues in the problem that made you choose that equation?
- What are the clues in the problem that let you know an equation was incorrect?

What are the clues in the problem that let you know you needed grouping symbols?

## What Makes a Team Response so Powerful?

1. Team responses are helpful when students are learning something new and are likely to make mistakes. (5.1B)

2. When deciding the team response, students will naturally have to justify their thinking in a small group. (5.1G)

3. Before communicating their responses, teams will rehearse which is great for ELL students. (5.1E)

4. It's not embarrassing to an individual if their team gets the wrong answer. (5.1D)

5. As each team responds, the other teams use critical thinking to judge other teams' responses against their own. (5.1F and 5.1G)

## How Can a Problem Have Two Right Answers? (5.1B)

Beware! While all students should get the same numerical answer when solving the problems, students may think through the problem solving process and, therefore, the equation in different ways. This means that there will probably be multiple right equations, particularly for the two-step problems. This is a great opportunity for students to learn from each other. Have students show their different right answers and have a scholarly debate.

- How are the right answers alike?
- How are they different?
- Is one answer better than another?
- How are the equations related?

# 5.OE.9 RAMP UP EXAMPLES (PG. 1 OF 2)

**1** On a mysterious planet full of *guadalca* fruit, *guadalca* farmers plant 13 rows of 9 *guadalca* trees each. However, they know that due to the planet's harsh climate, they will lose some trees from their orchard before the harvest. At the end of the growing season, they are able to harvest fruit from 96 *guadalca* trees. How many trees did they lose?

## Answer Choices:

A. $(13 - g) \times 9 = 96$

B. $13 \times (9 - g) = 96$

C. $(9 \times g) - 13 = 96$

D. $(13 \times 9) - g = 96$

**2** *Guadalca* fruit is delivered in boxes of 25 fruits each. After the harvest, the planet's king demanded the first 14 boxes for himself plus 9 more pieces of fruit for his children. How many pieces of fruit were brought to the royal family?

## Answer Choices:

A. $(9 \times 25) + 14 = f$
B. $(25 \times 14) + 9 = f$
C. $25 \times (9 + 14) = f$
D. $9 + 25 \times 14 = f$

# 5.OE.9 RAMP UP LETTER CARDS (PG. 1 OF 2)

A

B

# 5.OE.9 RAMP UP LETTER CARDS (PG. 2 OF 2)

C

D

# 5.OE.9 RAMP UP ANSWER KEY (PG. 1 OF 2)

**Directions:** Write the equation(s) and solve the problem.

**1** On a mysterious planet full of *guadalca* fruit, *guadalca* farmers plant 13 rows of 9 *guadalca* trees each. However, they know that due to the planet's harsh climate, they will lose some trees from their orchard before the harvest. At the end of the growing season, they are able to harvest fruit from 96 *guadalca* trees. How many trees did they lose?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $(13 - g) \times 9 = 96$<br>B. $13 \times (9 - g) = 96$<br>C. $(9 \times g) - 13 = 96$<br>D. $(13 \times 9) - g = 96$ | **Equation(s)**:<br><br>D. $(13 \times 9) - g = 96$<br><br>**Solution**: $g = 21$ trees |

**2** *Guadalca* fruit is delivered in boxes of 25 fruits each. After the harvest, the planet's king demanded the first 14 boxes for himself plus 9 more pieces of fruit for his children. How many pieces of fruit were brought to the royal family?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $(9 \times 25) + 14 = f$<br>B. $(25 \times 14) + 9 = f$<br>C. $25 \times (9 + 14) = f$<br>D. $9 + 25 \times 14 = f$ | **Equation(s)**:<br><br>B. $(25 \times 14) + 9 = f$<br>D. $9 + 25 \times 14 = f$<br><br>***Explanation***:<br>*Regardless of the parentheses or the order, the multiplication would be completed before addition in both equations, resulting in the same answer.*<br><br>**Solution**: $f = 359$ pieces of fruit |

# 5.OE.9 RAMP UP ANSWER KEY (PG. 2 OF 2)

**Directions:** Write the equation(s) and solve the problem.

**3** The king ordered 350 pieces of *guadalca* fruit to be divided up into equal-sized gift baskets for his 25 most loyal servants. He then added some pieces of suborbital chocolate and 1 gold nugget to each basket. If each servant received 18 items in their basket, how many pieces of suborbital chocolate were in each one?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $350 \div 25 + c + 1 = 18$<br>B. $350 \div c + 25 + 1 = 18$<br>C. $c + (350 \div 25) + 1 = 18$<br>D. $25 + 1 + c \div 350 = 18$ | **Equation(s)**:<br><br>A. $350 \div 25 + c + 1 = 18$<br>C. $c + (350 \div 25) + 1 = 18$<br><br>***Explanation***:<br>*Since division comes first in the order of operations, the parentheses do not change the order in which the equation is solved.*<br><br>**Solution**: $c$ = 3 pieces of chocolate |

**4** To keep the king from taking their entire *guadalca* crop, the farmers had a plan. They combined what was left of their crops, took out enough to live on through winter, then split what was left equally between three rockets to send to distant planets. They hoped this would keep their precious *guadalca* safe until they could bring it home. Which equation **could** show how many pieces of fruit were in each rocket?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $124 \div 3 - 72 + 101 = 51$<br>B. $[(124 + 101) - 72] \div 3 = 51$<br>C. $101 - 72 \div 3 + 124 = 51$<br>D. $51 \div 3 + (124 + 101) = 72$ | **Equation(s)**:<br><br>B. $[(124 + 101) - 72] \div 3 = 51$ |

# 5.OE.9 RAMP UP (PG. 1 OF 2)

Name: _____

**Directions:** Write the equation(s) and solve the problem.

**1** On a mysterious planet full of *guadalca* fruit, *guadalca* farmers plant 13 rows of 9 *guadalca* trees each. However, they know that due to the planet's harsh climate, they will lose some trees from their orchard before the harvest. At the end of the growing season, they are able to harvest fruit from 96 *guadalca* trees. How many trees did they lose?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $(13 - g) \times 9 = 96$<br>B. $13 \times (9 - g) = 96$<br>C. $(9 \times g) - 13 = 96$<br>D. $(13 \times 9) - g = 96$ | **Equation(s)**:<br><br>**Solution**: _____ |

**2** *Guadalca* fruit is delivered in boxes of 25 fruits each. After the harvest, the planet's king demanded the first 14 boxes for himself plus 9 more pieces of fruit for his children. How many pieces of fruit were brought to the royal family?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $(9 \times 25) + 14 = f$<br>B. $(25 \times 14) + 9 = f$<br>C. $25 \times (9 + 14) = f$<br>D. $9 + 25 \times 14 = f$ | **Equation(s)**:<br><br>**Solution**: _____ |

# 5.OE.9 RAMP UP (PG. 2 OF 2)

Name: _____

**Directions:** Write the equation(s) and solve the problem.

**3** The king ordered 350 pieces of *guadalca* fruit to be divided up into equal-sized gift baskets for his 25 most loyal servants. He then added some pieces of suborbital chocolate and 1 gold nugget to each basket. If each servant received 18 items in their basket, how many pieces of suborbital chocolate were in each one?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $350 \div 25 + c + 1 = 18$<br>B. $350 \div c + 25 + 1 = 18$<br>C. $c + (350 \div 25) + 1 = 18$<br>D. $25 + 1 + c \div 350 = 18$ | **Equation(s)**: |

**4** To keep the king from taking their entire *guadalca* crop, the farmers had a plan. They combined what was left of their crops, took out enough to live on through winter, then split what was left equally between three rockets to send to distant planets. They hoped this would keep their precious *guadalca* safe until they could bring it home. Which equation **could** show how many pieces of fruit were in each rocket?

| Answer Choices | Correct Answer(s) |
|---|---|
| A. $124 \div 3 - 72 + 101 = 51$<br>B. $[(124 + 101) - 72] \div 3 = 51$<br>C. $101 - 72 \div 3 + 124 = 51$<br>D. $51 \div 3 + (124 + 101) = 72$ | **Equation(s)**: |